SOMATOCHLORA MARGARITA, A NEW SPECIES OF DRAGONFLY FROM EASTERN TEXAS

(ODONATA: CORDULIIDAE)

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In late May and early June, 1961, several males and females of a new species of *Somatochlora* were taken in the vicinity of Cleveland, Texas. The discovery of this new species raises to five the number of species in the *Somatochlora filosa* group (which includes *filosa* (Hagen), *provocans* Calvert, *ozarkensis* Bird, and *calverti* Williamson and Gloyd and also extends the range of the genus southwestward into eastern Texas.

Somatochlora margarita, n. sp.

Holotype male.—Head. Labium and labrum pale yellow, the latter margined with dark brown and with an obscure median dark spot; anteclypeus pale; postclypeus pale with two dark punctae (clypealsinus); lower margin and sides of frons pale; upper part of frons metallic green with two pale yellow spots on the dorsum; vertex metallic violet-green with pale anterior margin; occiput dark with dark hairs; rear of head black with short pale hairs.

Thorax.—Prothorax dark brown, paler on sides; front and hind lobes pale. Pterothorax dark brown with greenish iridescence, paler laterally, yellow as follows: anterior half of mid-dorsal carina, spot on mesepisternum (about 1.5 mm. long), stripe on mesepimeron (about 5 mm. long and 1.5 mm. wide, with upper end rounded, lower end narrowed, and posterior border slightly sinuous), a small stripe below metastigma adjacent to metinfraepisternum, stripe on metepimeron (maximum width 1.5 mm.) which extends ventrally to unite with the stripe on the opposite side, and the antealar sinuses and interalar areas.

Wings.—Hyaline, membranule smoky brown, costae yellow, other veins and stigma dark brown.

Legs.—Dark, coxae pale postero-ventrally; anterior trochanter pale; posteromesal surface of femora paler proximally; front and middle femora with two and hind femur with six rows of denticles posteriorly, the mesal row in each case terminating in a prominent tooth; front and middle tibiae with two rows of from 6 to 10 black spines; tarsal claws with a large inner tooth.

Abdomen.—Segments 1 and 2 dark brown, 3 to 10 dark metallic green, pale yellow as follows: on segment 1 the postero-lateral edge and a smaller dorsal-apical stripe; on 2 a large subtriangular patch anterior to the transverse carina, a smaller patch on the posterior half of the genital lobe, two subtriangular postero-dorsal spots, and a pale line along the transverse carina; the intersegmental area between 2 and 3; on 3 a conspicuous antero-lateral triangular spot and the antero-ventral margins of the tergo; on 4 to 8 obscure antero-lateral pale spots. Appendages brownish-black.

Appendages.—The superior appendage is longer than 9 + 10, moderately angulated in lateral view, with a prominent lateral shelf along the basal half. In dorsal view the appendages are nearly parallel sided but converge evenly from the mid point to the tips, which then diverge slightly. The inferior appendage is triangular and typical for the *filosa* group.

Variation among the type series.—The pale dorsal spots of the frons are absent in two of the six males but are well developed in the other four. The vertex varies from almost completely dark to almost completely pale according to the extent of the anterior pale color. The pale spot on the mesepisternum is nearly absent in one specimen and varies from 0.75 to 2.5 mm. in length in the others, extending in the palest case to the anterior border of the pleura. The pale stripe of the mesepimeron varies from 0.75 to 1.5 mm. in width, and is narrowed at the upper end in one specimen only (similar to *ozarkensis*). The pale stripe below the metastigma is nearly absent in one specimen. The pale stripe of the metepimeron varies from 1.0 to 1.5 mm. in maximum width. Two specimens lack the obscure antero-lateral pale spot on abdominal segment 4, and three specimens (not including the holotype) have the ventral margins of 9 and 10 obscurely pale. Three specimens (not including the holotype) have an obscure postero-dorsal pale spot on 10 and a fourth has a vivid pale spot here. The holotype specimen represents the mean of the series for extent of pale color generally, except that it has the broadest pale metepimeral stripe of the six.

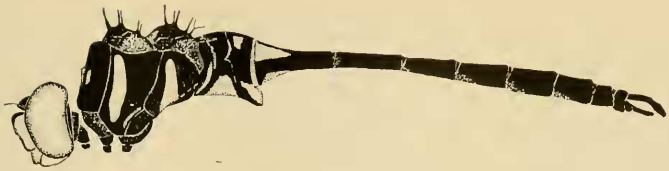
Allotype female.—Coloration as in the male, differing as noted below: pale spot on mesepisternum smaller; pale lateral stripes of the thorax more narrow; pale color on abdominal segment 2 consisting of a broad triangular patch narrowing upward and extending dorsally as a narrow yellow stripe that does not meet its fellow of the opposite side dorsally, and a very obscure pair of postero-dorsal pale spots. The remainder of the abdomen dark with basal pale markings more obscure than in the male.

Appendages and vulvar lamina.—The appendages are parallel sided with sharp tips and are typical for the group. The vulvar lamina is parallel sided in both ventral and lateral view, and it appears slightly pinched in ventral view. The tip is broadly rounded in both views.

Variation among the females.—The three females show little variation of note, except for size (discussed below). One female lacks the mesepisternal pale spot and one (not the same) has the pale color of segment 1 reduced.

Venation.—The six male specimens average 8 antenodals in the fore wings (varying from 7 to 9), 5 antenodals in the hind wings (one additional half-vein in one wing), 5 postnodals in the fore wings (4 to 6), 7 postnodals in the hind wings (6 to 9), 11 cells between M1 and M1a in the fore wings (8 to 16), 12 cells in this space in the hind wings (10 to 16), 3 cells bordering the triangles in both wings (2 cells in one fore wing and in two hind wings). Two of the males have only 2 cell rows in the fore wings from the triangle to the hind margin of the wing, one has an imperfect 3rd row in one wing, one has a 3rd a few cells long in both wings, and two (including the holotype) have imperfect 3rd rows in both wings. All specimens have 2 cell rows for only a short length behind the triangles in the hind wings. All specimens have subtriangles of 3 cells in the fore wings and 1 cell in the hind wings, and all have one vein behind the stigma.

The three female specimens average 8 antenodals in the fore wings (varying from 7 to 8), 5 antenodals in the hind wings (no variation). Half the fore wings contain 5 postnodals and half 6. The specimens average 7 postnodals in the hind wings (6 to 8), 15 cells between M1 and M1a in the fore wings (13 to 19), 15



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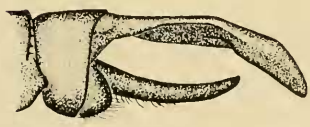

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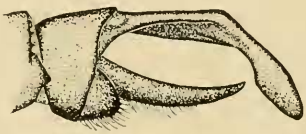

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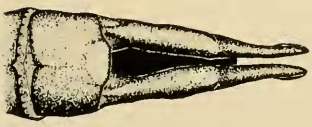

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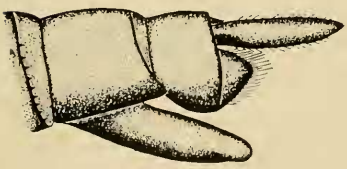

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Somatochlora margarita, figs. 1-6; *S. ozarkensis*, figs. 7-10. Figs. 1 and 2, color patterns of male and female; figs. 3 and 7, lateral view of male appendage; figs. 4 and 8, dorsal view of male appendages; figs. 5 and 9, lateral view of female appendages; figs. 6 and 10, ventral view of female appendages.

cells in this space in the hind wings (13 to 17), 3 cells bordering the triangles in both wings (one fore wing and two hind wings have 2). The allotype female has 2 cell rows between the triangle and the hind margin of the fore wings, with a well-developed 3rd row. The other two females have more imperfectly developed 3rd rows. All females have 2 cell rows in this space in the hind wings for a distance of only a few cells, as in the males. Triangles and subtriangles as in the males.

Measurements.—Abdomen without appendages: male, average 33 mm. (31.5 to 34 mm., holotype 33.5 mm.); female 36 to 41 mm. (allotype 41 mm.). Hind wing: male, average 35 mm. (32 to 36 mm., holotype 36 mm.); female. 34.5 to 37 mm. (allotype 37 mm.). Hind femur: male, average 7.5 mm. (7 to 8 mm.); female 8 mm. (7.5 to 8 mm.). Ratio of apical width to length on male segment 5: average about 3/5, varying from 1/2 to 2/3. Appendages of male 3.5 mm. long, longer than 9 + 10. Appendages of female 2 mm. long. Stigma 2.5 mm. long.

Related species.—This species belongs to the distinctively southern group of *Somatochlora* mentioned above. The following discussion of relationships is based on descriptions published by Walker (1925), Bird (1933), and Williamson and Gloyd (1933), and on examination of two specimens of *S. ozarkensis* from Oklahoma. Because of convergences in certain characters, I feel that it is no longer useful to modify Walker's excellent key to the genus; instead I will attempt to discuss the variation in more general terms.

Somatochlora margarita is very slightly smaller than the other species, although all of the species are similar in size. *Margarita* is generally paler than the others, but *calverti* (based on only two males) appears to have larger pale spots on the mesepisternum and on the dorsum of 10. Only *margarita* appears to have obscure pale basal markings on segments 4 to 8 of the abdomen. Although no dorsal pale spots on the frons were reported for *ozarkensis* in the original description, they are present in the topotype male (but not the female) I examined. They are absent in *provocans* and *calverti* but rather consistently present in *margarita*.

The shapes of the male superior appendages are distinctive for each species, those of *filosa* differing so much that further comparisons with that species have not been made. In lateral view *provocans* has the least angulated appendage (about 30°), *margarita* the next (35°), *ozarkensis* 40° and *calverti* 50°. In dorsal view the appendages of *margarita* are nearly straight, those of *ozarkensis* are knobbed midway to the end, those of *calverti* are excavated apically and divergent at the tips, and those of *provocans* are strongly angulated as well as knobbed. Only *calverti* lacks the prominent lateral marginal shelf along the basal half of the superior appendage.

The vulvar laminae of *provocans* and *margarita* are very similar and without having studied actual specimens of the former I will not attempt to distinguish them. That of *ozarkensis* is broader and

more rounded in both ventral and lateral view, and is more pointed at the tip. The female of *calverti* is unknown.

The new species *margarita* is probably closest to *ozarkensis,* but is easily distinguished from that species by the shape of the male appendages, the vulvar lamina of the female, and the color pattern of both sexes.

Material examined.—Holotype male: Big Creek, 5 miles south south-east of the Double Lake Recreation Area, Sam Houston National Forest, San Jacinto County, Texas, collected 30 May, 1961. The remainder of the specimens were collected at the same locality on 28 May, 30 May, 4 June, and 11 June. The actual locality was along a dirt road which crossed the creek in a pine woods, and no specimens were taken along the stream. A male of *S. ozarkensis* from Wilburton, Latimer County, Oklahoma, and a female from the Ouachita National Forest, LeFlore County, Oklahoma, both collected during 1934 by A. E. Pritchard, were examined.

The holotype male and the allotype female have been deposited in the collection at the University of Florida. A paratype male and female are in the Williamson collection in Ann Arbor, another male is in the collection of the Royal Ontario Museum in Toronto, and another male is in the collection of the Academy of Natural Sciences, Philadelphia. The remaining paratypes will remain in the author's collection.

Habits.—*Somatochlora margarita* was found flying along a dirt road in the pine woods of the Sam Houston National Forest in eastern Texas. The country is low and gently rolling here, and the streams are clear, sandy, and not conspicuously colored by tannin. Most of the specimens were netted while flying rather high above the road; indeed I was forced to catch the majority of them with a long-handled net while I stood on the roof of a pickup truck! The technique was to drive slowly along the road until a hawking *Somatochlora* was seen, and then to climb out onto the roof and attempt to net the dragonfly. A few specimens (mostly females) were taken while they flew closer to the ground. All of the specimens were taken early in the morning or late in the afternoon; at mid-day no *Somatochlora* were seen at all.

Flying with the new species were *Somatochlora lineuris* (Hagen), *Macromia georgina* (Selys), *Cordulegaster obliqus* (Say), *Libellula needhami* Westfall, and *Tramea onusta* Hagen. The nearby stream with its incredibly rich Odonate fauna (about forty species, largely gomphines, aeschnines, and cordulines) is the probable breeding site for this species, but no nymphs were found.

Acknowledgements

It is a pleasure to acknowledge the loan of specimens of *Somatochlora ozarkensis* by Minter Westfall. The new species is named for

Miss Margaret Stevenson, a delightful companion of my wife and myself on all of our collecting trips during the spring of 1961, and a very great help to us during the bizarre maneuvers which were required in order to net this most elusive and beautiful insect.

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A NEW SPECIES OF MALLOPHAGA FROM NEW GUINEA

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In a small collection of Mallophaga received for determination from the Bernice P. Bishop Museum was a series from a New Guinea Wallaby which apparently represents a new species. That form is herewith described and illustrated.

Heterodoxus maai, new species

Holotype male.—General shape and chaetotaxy as shown in figure 1. Male genitalia, minus genital sac, as shown in figure 3. The male genital sac is without heavy spines found in *Heterodoxus longitarsus* (Piaget, 1880) as illustrated by Werneck (1941). Thoracic sternal plates with fewer setae, and the abdominal sternites with more setae than in *Heterodoxus forcipatus* (Mjöberg, 1919) as illustrated by Werneck (1948). The heavy spines on the prothorax are not found on *Heterodoxus spiniger* (Enderlein, 1909). In addition to differences in chaetotaxy, the male genitalia are distinctive. Total length, 3.47 mm.

Allotype female:—General shape and chaetotaxy, except for terminal abdominal segments, as in the male. Terminal abdominal segments as shown in figure 2. Total length, 3.45 mm.

Type host:—*Dorcopsis veterum* (Lesson, 1826).

Type material:—Holotype male, allotype female and paratypes of both sexes collected by T. C. Maa at Eramboe, Netherlands New Guinea on November 2, 1960. The Bernice P. Bishop Museum number is TMP 2052. The host skin is presently in the American Museum of Natural History (AMNH 193156) and was identified by H. M. Van Deusen.

Discussion:—This species is unusual in that it is the only known species of *Heterodoxus* with the antennae completely concealed inside lateral indentations. The dorsal and ventral surfaces of these indentations are of equal expansion. This is the first record of Mallophaga from this genus of host.